WE CLAIM:

1. A black-and-white thermally developable material comprising a support having thereon:

a) one or more thermally developable imaging layers comprising a binder and in reactive association, a non-photosensitive source of reducible silver ions that includes at least a silver carboxylate, and a reducing agent composition for said non-photosensitive source of reducible silver ions, said binder comprising from 0 to less than 50% of a polymer latex based on total binder weight, and

b) a barrier layer that is on the same side of but farther from said support than said one or more imaging layers, said barrier layer containing as a scavenger, a water-insoluble compound having the following Structure I:

$$M(X)_n$$

(I)

wherein M is a first row transition metal cation, X is a hydroxyl group, or an organic carboxylate having a molecular weight of from about 55 to about 500, and n is an integer representing the positive charge on M,

wherein the amount of said scavenger being from about 0.1 to about 1 mole per mole of said silver carboxylate.

2. The thermally developable material of claim 1 wherein M is a zinc, nickel, manganese, or cobalt metal ion, X is hydroxyl or an aliphatic carboxylate having 2 to 4 carbon atoms or an aromatic carboxylate.

3. The thermally developable material of claim 2 wherein M is a zinc or nickel metal, X is an aliphatic carboxylate.

4. The thermally developable material of claim 1 wherein said scavenger is zinc acetate, zinc hydroxide, zinc acrylate, zinc methacrylate, zinc benzoate, nickel acetate, manganese acetate, or mixtures thereof.

5. The thermally developable material of claim 1 wherein said scavenger is dispersed in a binder in particulate form having an average particle size of 1 μm or less.

6. The thermally developable material of claim 1 wherein said scavenger is dispersed in a binder in particulate form having an average particle size of from about 1 nm to about 0.5 μm.

7. The thermally developable material of claim 1 wherein said barrier layer is the outermost layer on the imaging side that also acts as a protective topcoat.

8. The thermally developable material of claim 1 wherein said barrier layer further comprises a hydrophobic binder.

9. The thermally developable material of claim 1 further comprising a protective layer that is disposed between said barrier layer and said one or more imaging layers.

10. The thermally developable material of claim 1 further comprising an outermost protective overcoat layer, and said barrier layer is disposed between said outermost protective overcoat layer and said one or more imaging layers.

11. The thermally developable material of claim 1 wherein said non-photosensitive source of reducible silver ions comprises a silver fatty acid

carboxylate having 10 to 30 carbon atoms in the fatty acid or a mixture of said silver fatty acid carboxylates, at least one of which is silver behenate.

12. The thermally developable material of claim 11 further comprising a co-developer.

13. The thermally developable material of claim 12 further comprising a contrast enhancing agent.

14. The thermally developable material of claim 1 wherein said barrier layer further comprises a surfactant, lubricant, matting agent, adhesion promoter, stabilizer, or acutance dye.

15. The thermally developable material of claim 1 that is a photothermographic material further comprising a silver halide or mixture of silver halides as a photocatalyst.

16. The thermally developable material of claim 1 that is a photothermographic material containing a silver halide that is sensitive to radiation of from about 300 to about 850 nm.

17. The thermally developable material of claim 1 that is a photothermographic material containing a silver halide that is sensitive to radiation of from about 750 to about 1150 nm.

18. The thermally developable material of claim 1 wherein said barrier layer is capable of retarding the diffusion of or reacting with fatty carboxylic acids.

19. The thermally developable material of claim 1 wherein said barrier layer is capable of retarding the diffusion of or is reactive with behenic acid and/or a hindered phenol developing agent.

20. The thermally developable material of claim 1 wherein said barrier layer is present at a dry thickness of from about 1.5 μm to about 3 μm.

21. The thermally developable material of claim 1 further comprising a phthalazine toner.

22. A black-and-white photothermographic material comprising a support having thereon:

a) one or more thermally developable imaging layers comprising a binder and in reactive association, a photosensitive silver halide, a non-photosensitive source of reducible silver ions that includes at least a silver carboxylate, and a reducing agent composition for said non-photosensitive source of reducible silver ions, said binder comprising from 0 to less than 50% of a polymer latex based on total binder weight, and

b) a barrier layer that is on the same side of but farther from said support than said one or more imaging layers, said barrier layer containing as a scavenger, a water-insoluble compound having the following Structure I:

$$M(X)_n$$

(I)

wherein M is a first row transition metal cation, X is a hydroxyl group, or an organic carboxylate having a molecular weight of from about 55 to about 500, and n is an integer representing the positive charge on M,

wherein the amount of said scavenger being from about 0.1 to about 1 mole per mole of said silver carboxylate.

23. A black-and-white photothermographic material comprising a support having thereon:

a) one or more thermally developable imaging layers comprising a hydrophobic binder and in reactive association, a photosensitive preformed silver halide that is a silver bromide, silver iodobromide having up to 10 mol % silver iodide, or mixtures of these silver halides, a non-photosensitive source of reducible silver ions comprising one or more silver fatty acid carboxylates that include silver behenate, and a reducing agent composition for said non-photosensitive source reducible silver ions comprising a hindered phenol, said binder comprising from 0 to less than 50% of a polymer latex based on total binder weight, and

b) a barrier layer that is on the same side of but farther from said support than said one or more imaging layers, said barrier layer comprising a scavenger that is zinc acetate, zinc hydroxide, zinc acrylate, zinc methacrylate, zinc benzoate, nickel acetate, manganese acetate, or mixtures thereof, said scavenger present in an amount of from about 0.4 to about 0.6 mole per mole of said one or more silver fatty acid carboxylates, and said barrier layer having a dry thickness of from about 1.5 μm to about 3 μm.

24. The black-and-white photothermographic material of claim 23 further comprising:

c) on the backside of said support, one or more layers wherein at least one layer comprises an antihalation composition and/or a conductive material.

25. The black-and-white photothermographic material of claim 23 further comprising one or more additional thermally developable imaging layers on both sides of said support.

26. A method of forming a visible image comprising:

A) imagewise exposing the thermally developable material of claim 1 that is a photothermographic material to electromagnetic radiation to form a latent image, and

B) simultaneously or sequentially, heating said exposed photothermographic material to develop said latent image into a visible image.

27. The method of claim 26 wherein said photothermographic material has a transparent support and said method further comprises:

C) positioning said exposed and heat-developed photothermographic material between a source of imaging radiation and an imageable material that is sensitive to said imaging radiation, and

D) exposing said imageable material to said imaging radiation through the visible image in said exposed and heat-developed photothermographic material to provide an image in said imageable material.

28. A method of forming a visible image comprising:

A) imagewise applying thermal energy to the thermally developable material of claim 1 that is a thermographic material to form a visible image.

29. The method of claim 26 wherein said visible image is used for medical diagnosis.